Eureka!

The Journal of Mining Collectibles

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Eureka! The Journal of Mining Collectibles

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Youngs' Patent Oil Wick Lamp

by Dave Johnson

What exactly is the odd sounding occupation of coal getter? According to The History, Topography, and Directory of the County Palatine of Durham by Francis Whellan. Second edition published in 1894, *"The actual coal getter is the one who is directly employed in digging and filling away the coal. This work while it lasts is of all the occupations in a coal-mine the most laborious. Whether the seam be so narrow that he can only creep into it on his hands and knees, or whether it be lofty enough for him to stand upright in, he is the responsible workman who loosens the coal from its bed. All the arrangements below ground are made to suit him; he is in fact the centre of the mining system. The getters are divided into what are called fore-shift and back-shift men. The former are usually roused by the caller at three in the morning, commence work at four, and leave off at eleven. The back-shift men start at ten, and cease work at four. All the men work in each shift one week alternately. For all the working places in a colliery "cavels" or lots are drawn as to which places the men are to work during the ensuing three months. This system prevents them from being subject to the caprice or favor of the overmen, and may account in some degree for the spirit of sturdy independence which so strongly characterizes the northern miner."* The coal getter was the skilled miner, the most highly paid underground worker. I have also heard these individuals referred to as a faceman, hewer and coal digger.

Few mining artifacts are actually marked with the word *miners'* and even fewer the unusual term *getters'*. The lamp shown here carries both terms. It is a Scottish-style oilwick cap lamp stamped YOUNG'S PATENT MINERS' OR GETTERS' LAMP. While the Scottish-style oilwick is a unique shape, this oilwick lamp is unique among Scottish-style lamps both for its stamping and for several physical attributes. Of the 71 Scottish-style oilwick cap lamps in my collection, this is the only steel one to have a copper wick tube. It is also the only one (steel brass or copper) to have holes in the wick tube, vent holes in the outer spout brace, holes around the wick tube where it pierces the outer spout brace and the hanging hook attached to a bracket made of fine wire mesh that is soldered to the font. The only function I see for this mesh is to act as a match striker. This is truly a unique little lamp.

Having tracked all known oilwick names for years, when I first saw this lamp listed on ebay I recognized the Youngs' Patent to be a new name. It is the only Scottish-style oilwick I have seen that makes any reference to a patent, either being patented or a patent date. In the photos shown in the listing the Young's Patent stamping could be made out. However, I could see that there was a stamping on the other side of the lamp that the seller did not include in the listing and that was not legible in the photo. When asked about this, the seller could not see the second stamping. It was not until I received the lamp that I was able to determine that it said Miners' or Getters' Lamp. The lamp was covered with a heavy coat of gold paint that was obviously added after the lamp was used (see before photos). When the paint was removed the two deep stampings were fully revealed. While obviously used, this lamp was not at all beat up. It stands 2 ¼" tall to the top of the dome lid.


Lamp was found with gold paint over used lamp.

John Davis & Son Dwarf Deputy Marsaut Safety Lamp

by Dave Johnson

John Davis, and later John Davis & Son, were prolific manufacturers of miners' flame safety lamps, anemometers, other mining instruments and other mining items. Davis Derby manufactured many products which had been invented by prominent mining engineers and other inventors of the time, such as Biram's anemometers, John Hedley's Miner's dial and Hoffmans patented tripod head from the USA. The Company also had a close relationship with Mr A. H. Stokes, His Majesty's Inspector of Mines, and patented a miners lamp shut off device originally invented by Mr. Stokes. In 1890 Davis took on the UK agency for coal cutters manufactured by the Jeffrey Company of Columbus, Ohio.

John Davis died in 1873 at the age of 63, his brother Edward, his elder son Frederick and his second son Alfred were appointed executors to run the business. Frederick and Alfred were both trained as civil engineers and Edward was very much involved in running his own business in Leeds, consequently Henry Davis was soon appointed by his brothers to run the business. When Henry took over the business the workshop was fitted out with four large lathes and four small lathes, fourteen pairs of vices, a new vice bench and eight sets of working men's tools, suggesting that eight instrument makers were employed.

Under the leadership of Henry Davis the business continued to expand, moving to new premises in November 1875 at All Saints Works Amen Alley in Derby close to the Cathedral. The earliest surviving Davis Derby catalogue is dated in 1877 and shows that products included turret clocks, surveying instruments, a wide range of miners lamps, anemometers, electric bells for both mining and domestic use, pressure gauges, opera glasses, spectacles, medical devices and weather vanes. This catalogue also shows that the firm was actively involved in the generation of electricity for lighting.

It is interesting to note that in February 1893 the Federated Institution of Mining Engineers visited Davis Derby and reported the visit as 'An Hour At All Saints Works'. This report describes a pioneer installation for the generation and supply of electrical power for supplying neighboring hotels, shops and offices. At the time of the visit the company was reportedly capable of manufacturing 500 miners' lamps each week, and these were dispatched all round the world. It is worthy of mention that in 1886 the final report of the Royal Commission On Accidents in Mines was presented and under the heading 'Safety Lamps' three out of four of the lamps selected as the safest were made by Davis Derby. These were the Bonnetted Clanny, the Marsaut and the Bonnetted Muesler.

An interesting safety lamp produced by Davis, in what must have been very limited numbers judging by the few specimens still in existence, is the Dwarf Deputy Marsaut lamp. At 7 ¾" tall, this lamp is just ¾" taller than its more commonly seen competitors, the William Maurice Sheffield Baby Wolf from England and the Baby Wolf from the U.S. (see photos on following pages).

Davis dwarf next to a standard sized lamp.

Above and below: name stampings.

Spring-loaded column and air regulator ring.

Burner assembly

This lamp has a lead rivet hasp locking mechanism and a removable Marsaut bonnet secured in place by an extra spring-loaded pillar. What makes this lamp unique is its spring-loaded air intake regulator. This mechanism consists of a flat brass ring with holes under the bonnet. The air intake is through these holes which remain open until the ring is turned slightly, blocking the lower air intake. A faint click when turned indicates that the air intake is closed. It is opened again by pulling down on the spring-loaded pillar, the spring on the ring returning it to the open position. This is the first example of this lamp that I have seen and had the opportunity to purchase.

Left to right: William Maurice Sheffield Baby Wolf, Davis Dwarf, U.S. Baby Wolf.

A Canadian Oil Wick Cap Lamp

by Dave Johnson

Nova Scotia has been a long-time source of coal for use domestically and abroad. The Nova Scotia coal deposits are divided into the Sydney, Cumberland, and Pictou Coalfields. Canada has one-sixth of all the coal reserves in the world, almost as much as the entire continent of Asia, and second only to the United States.

The Sydney coal field, the largest and most valuable in Nova Scotia, is situated on the north eastern coast of Cape Breton Island, extending from Mira Bay on the south to Cape Dauphin on the north, a distance of thirty miles, and has a general dip northeast under the Atlantic. The field embraces the mining communities of Morien, Birch Grove, Reserve, Dominion, Glace Bay, New Waterford, and Sydney Mines. The city of Sydney is situated about midway between the northern and southern extremities of the field and on the western fringe of the productive coal measures.

Coal was first mined in the Sydney Coalfield by the French military from outcroppings in 1685. Later, in 1720, organized mining was conducted in the Blockhouse Seam in the Morien Basin. For the next 100 years, outcrop mining was done in various parts of the field. In 1825, the General Mining Association was formed and, two years later, an effort was made to do systematic mining in the Sydney Mines and New Waterford Districts. In 1849, the Crown conveyed its interests in the minerals of the Province to the Government of Nova Scotia. In 1857 the General Mining Association, which until then held under sub-lease all the mineral areas of the Province, in consideration of certain concessions and privileges, surrendered its holdings to the Government of Nova Scotia, reserving, however, for its own operation certain areas in Cumberland, Pictou and Cape Breton Counties, totaling 30 square miles. Shortly thereafter, several mining companies were formed and mines were opened in the Glace Bay District. In l90l the General Mining Association sold out its interests in Sydney Mines to the Nova Scotia Steel & Coal Company.

In the Cape Breton Coalfield, the Glace Bay District contributes 46 percent, the New Waterford District 37 percent and Sydney Mines 17 percent of the coal produced in the area.Due to submarine conditions, it is not possible to accurately determine the tonnage yet recoverable from this field. Already approximately 219,000,000 tons has been extracted and it is estimated that 257 million tons of economically recoverable coal is still available within proven areas of the Dominion Coal Company, Limited and 23.5 million tons within the area of the Old Sydney Collieries, of a quality equal to that being mined at the present time, and that the recoverable coal, without regard to quality or economic feasibility, within the limits of five miles seawards from the shore is approximately 947 million tons, sufficient to last for nearly 200 years at the present rate of production.

The Cumberland Coalfield consists of a basin-shaped strip of coal stretching from Chignecto Bay in the west where the seams dip under the Bay of Fundy, in a South-Easterly direction to the Town of Springhill, a distance of 25 miles.

The basin is approximately 12 miles wide, lying between the Cobequid Highlands in the North, East and South, and is entirely located in Cumberland County. The coal areas are located mainly in the Joggins River and Hebert areas in the North and at Springhill near the Eastern end of the basin; this latter area being the most important in the field.

In the Cumberland Coalfield, the coal areas at Springhill, in common with those in other districts in Nova Scotia, were originally leased in 1825 to the General Mining Association by the Duke of York. When the lease was nullified in 1857, having in 1849 released to the Government of Nova Scotia all its interests in the minerals of the province, the General Mining Association, as compensation for loss of rights was permitted to select and retain certain limited areas. Among these were four square miles of coal lands at Springhill.Lack of transportation facilities prevented coal being mined other than at the outcrops by farmers for their own use, until 1870. With the prospect of rail transportation becoming available, a Company known as the Springhill Mining Company was formed. This Company leased from the Government certain areas outside the limits of the General Mining Association holdings, and systematic coal mining on a moderate scale began.

In 1878 the workings had reached the boundary of the General Mining Association property and in the following year this area was transferred through the Crown from the G. M. A. to the Springhill Mining Company. A few years later the Springhill and Parrsboro Coal and Railway Company was organized.

These two companies were merged in 1884 under the title of the Cumberland Railway and Coal Company, which began mining on a much larger scale. In 1910 the Dominion Coal Company Limited absorbed the Cumberland Railway and Coal Company. Springhill was the site of three mine disasters in 1891, 1956 and 1958, which killed 125, 39 and 74 miners respectively.

It is reported that coal was first discovered in Pictou County, at Stellarton, in 1798 and that in 1807 the first license to mine coal was issued to John McKay. In 1817, Adam Carr obtained a lease from the Crown to mine and export coal. In 1825, through the prerogative of the Crown, the then Duke of York obtained a lease of all the mineral rights in Nova Scotia, with the exception of a few small areas already leased or held under grants.. Messrs. Rundell, Bridge & Rundell of London, received a transfer of the Duke's lease which they subsequently transferred to a Company known as the General Mining Association.

In 1827, the General Mining Association came to Pictou County and sank the Store Pits on the Foord Seam. By 1829 they had completed a six mile long railway, which connected the mines to the wharf at Abercrombie. It is worth noting that the first steam locomotive on the American continent ran on this line.

In 1849, the mineral rights were vested in the Province of Nova Scotia and in 1857 the original lease of the General Mining Association was nullified. As partial compensation for loss of their original rights, the General Mining Association was permitted to select and retain certain limited areas, amongst these were four square miles surrounding the town of Stellarton.

It had been the intention of the General Mining Association to work the iron deposits as well as the coal. A blast furnace was erected at the Albion Mines and iron ore was sent in from the Springville District. These efforts at iron smelting proved unsuccessful and the project was soon abandoned.

The Acadia Coal Company was organized in 1864, securing leases adjoining those of the General Mining Association, They sank the Thorn Pit on the MacGregor Seam in 1866. This pit was soon abandoned as the Acadia seam, which was more commercially promising, was discovered about two miles to the westward at a location that is now the site of Westville. The working of this seam was successful and led to the formation of the Inter-colonial Coal Company, which acquired leases to the south of the Acadia properties and sank the Drummond Slope to work the Acadia Seam.

In 1871 the Nova Scotia Coal Company was formed, leasing coal lands to the north of the Acadia areas. They sank the Black Diamond Slope, also on the Acadia Seam. This latter area was sold to the Nova Scotia Steel & Coal Company, Limited, in 1889. They sold it to the Acadia Coal Company in 1893. In 1872 the Vale Coal & Iron Manufacturing Company was organized. They purchased leases of coal lands at Thorburn and began operations in the MacBean Seam.

In the same year, 1872, the Halifax Coal Company was formed, purchasing all the mining rights of the General Mining Association in Pictou County. In 1886, the Acadia Coal Company, the Halifax Coal Company and the Vale Iron & Manufacturing Company all merged under the title of the Acadia Coal Company, Limited.

In 1900, the Nova Scotia Steel & Coal Company Limited, after securing the leases of coal lands between New Glasgow and Thorburn, sank the Marsh Shaft on the MacKay Seam. In 1919, the Acadia Coal Company was purchased by the Nova Scotia Steel & Coal Company and thus came into the merger of the British Empire Steel Corporation in 1921.The Pictou Coal Field today is largely depleted, although certain sections of the field still contain pockets of mineable coal. The coal field lies about 9 miles inland from the shore of Northumberland Strait and just beyond the head of the tidal water of the East River, at which point we find the Town of Stellarton.

The area occupied by the productive coal is comparatively small as the coal belt extends, roughly, only ten miles in an East and West direction, with a minimum width of three miles. The Town of New Glasgow is situated on the northern boundary of the coal field and lies approximately half-way between its eastern and western extremities. New Glasgow has been the commercial and industrial center of northern Nova Scotia, known best for its ship building industry.

New Glasgow, Nova Scotia was the home of the only Canadian producer of marked oilwick cap lamps that I am aware of. The lamp is stamped:

THOMPSON & Co.

MAKERS

NEW GLASGOW, N.S.

I have been unable to obtain any information on this manufacturer to date. Given the extent of Canadian coal mining, it is surprising that more mine lamps were not produced in Canada, at least marked lamps. In my collection I have a Canadian Fleming’s Special carbide handlamp and an H.L. Piper hanging oilwick lamp.

This double spout lamp, of all steel construction, is well made and most resembles a cross between a Grier Bros. and George Anton face lamp. It stands 2” tall to the top of the lid and has a bottom diameter of 1 5/8”.

Has anyone else found other marked Canadian mine lamps?

Source: The Louis Frost Notes 1686-1962.

Miners' Ball and Peg Lamps

by Dave Johnson

A miners' lamp unique to the mines of South Wales is the ball & peg lamp, just as the "midge" lamp is unique to the northern English coal fields, the Lake Superior-style hook candleholders are unique to the Wisconsin/Minnesota/Michigan iron and copper mines, and blende lamps vary in style by region of use (Freiberger, Halleiner, Freitaler and Schneeberger).

Ball & peg lamps fall into the "spherical font" lamp realm, as do many of the oil lamps used in blende carriers and the German urn miners' lamps

The ball & peg lamps were manufactured of either steel or brass, or a combination of both. Dating from at least the 1850s through the early 1900s, these rare lamps are seldom seen by collectors today.

They were all manufactured with screw-threads at the top and bottom of the spherical fuel font. A closed-end threaded tube could be screwed to the base to serve as a handle, or screwed over the burner to protect the wick, and allow the lamp to be carried in the pocket without leaking. These lamps could be carried in the hand and reportedly attached to the miner's cap through the use of a loop on the cap to hold the handle. These oil lamps attached to a miners' cap would have stood up higher than the better-known oilwick cap lamps, making them inconvenient in low-headroom mines.

Pictured here are three significantly different ball & peg lamps in my collection. The one on the left is of all steel construction except from brass threads. The entire handle unscrews from the bottom of the font and screws over the burner. It measures 5 5/8" tall and 2.5" in diameter.

The center lamp is of all brass construction and weighs almost twice what the two steel lamps each weigh. The entire handle unscrews from the bottom of the font and screws over the burner. The handle is conical and comes to a very sharp point that could easily be used as a weapon. The fuel font is not made of two half spheres with a crimped and soldered seam running around the circumference of the font, as in the other two lamps seen here. This lamp measures 6" tall and 2.3" in diameter.

The lamp on the right is mostly steel with brass threads and a brass piece at the end of the fixed handle. Just the brass end cap unscrews and screws over the very short burner, with the remainder of the handle remaining in place, an uncommon feature on this type of lamp. This lamp measures 5" tall and 2.8" in diameter.

N° 8028 A.D. 1894

Date of Application, 23rd Apr., 1894
Complete Specification Left, 31st May, 1894—Accepted, 7th July, 1894

PROVISIONAL SPECIFICATION.

Improvements in Miners' Lamps.

I, ARTHUR MORRIS, of 17 and 26, Duke Street, Aberdare, in the County of Glamorgan, Manufacturer, do hereby declare the nature of this invention to be as follows:—

My invention relates to miners' or colliers' lamps of the kind provided with a removable shank by which the lamp is held.

Hitherto this shank has usually been left open at the lower end, but according to my invention I close the said shank and make it in two parts adapted to be screwed together or otherwise connected so that the lower part of the shank may be utilized as a receptacle for matches and in such a manner that when closed there is no risk of the matches becoming ignited and at the same time when a match is required it is simply necessary to unscrew the receptacle from the other part of the shank.

It will be obvious that this arrangement does not prevent the shank being used as a cover for the lamp burner.

In practice I find it advantageous to provide any suitable part of the lamp with a frictional surface for igniting the matches.

Dated the 23rd day of April 1894.

G. F. REDFERN & Co.,
4, South Street, Finsbury, London, Agents for the Applicant.

COMPLETE SPECIFICATION.

Improvements in Miners' Lamps.

I, ARTHUR MORRIS, of 17 and 26, Duke Street, Aberdare, in the County of Glamorgan, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to miners' or colliers' lamps of the kind provided with a removable shank by which the lamp is held.

Hitherto this shank has usually been left open at the lower end, but according to my invention I close the said shank and make it in two parts adapted to be screwed together or otherwise connected so that the lower part of the shank may be utilized as a receptacle for matches and in such a manner that when closed there is no risk of the matches becoming ignited and at the same time when a match is required it is simply necessary to unscrew the receptacle from the other part of the shank.

It will be obvious that this arrangement does not prevent the shank being used as a cover for the lamp burner.

In practice I find it advantageous to provide any suitable part of the lamp with a frictional surface for igniting the matches.

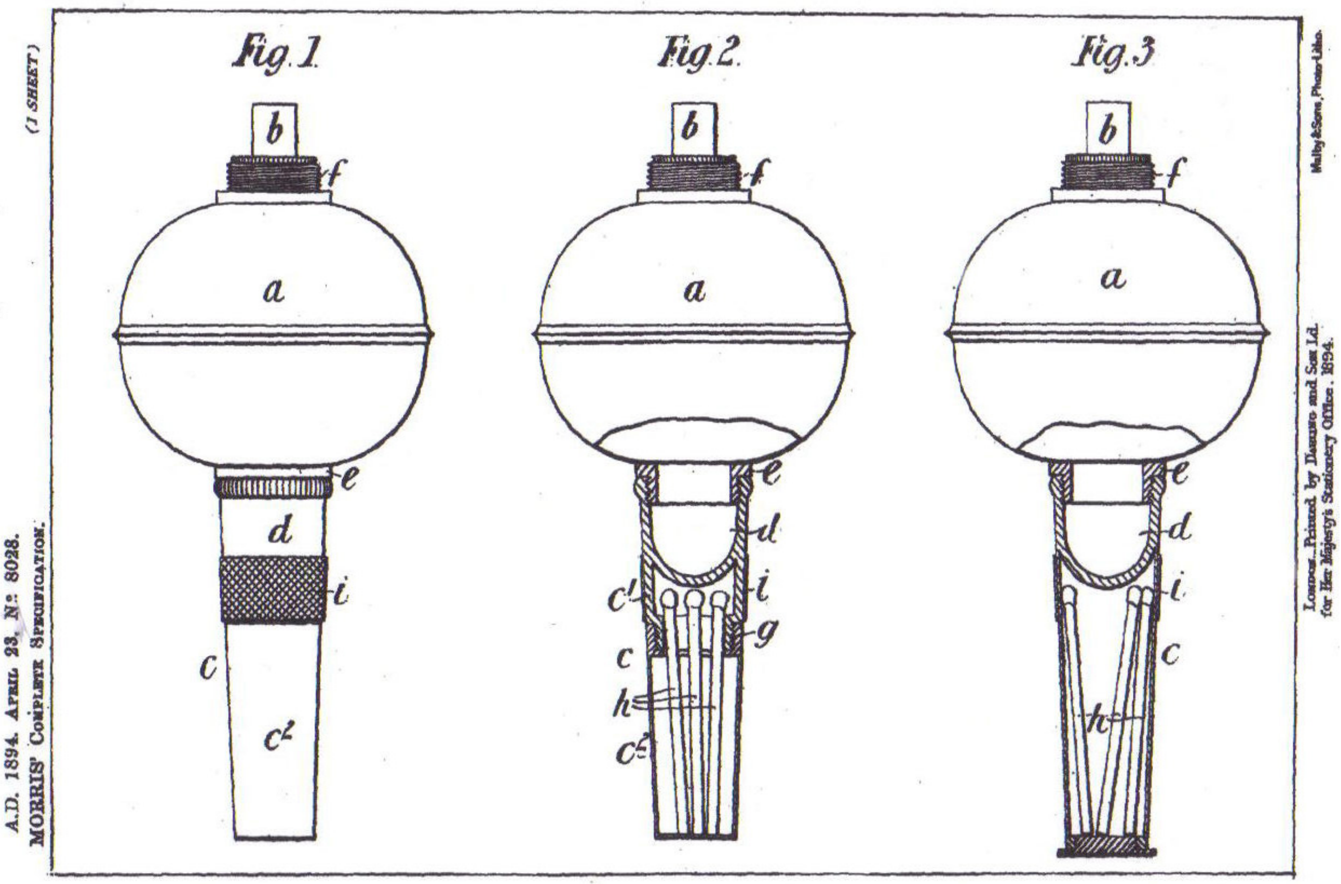
To enable my invention to be fully understood I will describe the same by reference to the accompanying drawing, in which:—

Figure 1 is an elevation of a miner's lamp having my improvements applied thereto; and,

Figure 2 is a sectional elevation of the same.

Figure 3 is a sectional elevation illustrating a modification.

[This Drawing is a reproduction of the Original on a reduced scale]



Although rare today, these lamps were in common enough use that at least one British patent for ball & peg lamps exists, granted to Arthur Morris, of Aberdare, Glamorgan County. Aberdare is also the home of safety lamp manufacturer E. Thomas & Williams, established in 1860. Coal and iron mining were at one time one of the primary industries of Glamorgan County and the last deep mine, Tower Colliery, closed January 8, 2008. Tower Colliery was the oldest continuously worked deep coal mine in the United Kingdom (started 1805), and possibly the world, and the only mine of its kind remaining in the South Wales Valleys. It is located near the villages of Hirwaun and Rhigos, north of the town of Aberdare in the Cynon Valley, south Wales. A few smaller coal mines, like Aberpergwm Colliery and Unity Mine, still operate within Glamorgan County but are only a faint shadow of the formerly significant coal mining industry.

Morris' patent, granted July 7th of 1894, was for a sealed matchsafe in the handle of the lamp, along with a knurled match striker encircling the handle, see the patent drawing. If other patents exist for the ball & peg lamp I am not aware of them.

My thanks to Manfred Stutzer for sending me the patent information.

British Wolf Safety Lamp Filler

by Dave Johnson

The Wolf Safety Lamp Company website states: “The Wolf Safety Lamp Company was established in Leeds, West Yorkshire, in the 1880's as a subsidiary of Friemann & Wolf of Zwickau, Germany. In 1912 the Leeds company was bought and moved to Sheffield in South Yorkshire where it began to develop safety lamps more suited to British methods and regulations of mining. The company was incorporated in 1916 and in 1934 moved to the larger Saxon Road Works, where it is still sited today.” An advertisement from the Wolf Safety Lamp Co. (Wm. Maurice) Ltd. States: “Sole Owners of the business established at Leeds in 1905 and transferred to Sheffield in 1913.”

The Wolf Safety Lamp Co. in England, under the direction of William Maurice, produced safety lamps, carbide hand lamps and carbide cap lamps, as well as the safety lamp filler shown here. It has a great detailed relief brass name plate with a wolf holding a safety lamp in its mouth. The body, spout and two handles are made of spelter coated steel. The breather tube that runs from the end of the spout to just below the filler cap is copper. The cap and threads are machined brass. The base is just a hair under 6” in diameter and it is 9” to the top of the filler cap.

Above: Wolf Safety Lamp filler, brass name plate and vent tube.

Left: William Maurice (1872–1951)

"How Mining Is Done"

Jack Purson

I ran across this article while I was looking for other information. As you can see it is dated the later half of 1909, when miners still used candlesticks. The journal appears to be some kind of "Popular Mechanics" sort of publication where people in industry write in to tell the general public about their product or process. This particular one was a simplistic summary of a more detailed article published elsewhere. I did not see much advertising in the rest of the publication but most articles did seem to be subtly hawking the latest and greatest technology. I found it interesting how the writer chose their words. Perhaps it was intended to come off sounding intelligent and sophisticated. I especially liked the use of the phrase "the mine is alive with men at work". As an aside, I found no reference at all to environmental issues. Miners were apparently expected to become an integral team of professionals who were responsible for learning and understanding the intricate details of their mine, to 'become one' with the earth but yet were individually responsible for their own safety. The sketch of the underground is really nice and conveniently lacks details that show dangers. There is a brief mention about how single and double jacking are being replaced with compressed air drilling. A majority of text is devoted to drilling and blasting as if the author might believe that this is the most important part of mine development or perhaps the other parts are less interesting? It makes an interesting story and I hope you get your mind into the period as you read.

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HOW MINING IS DONE

In mining the aim is to take out ore at the lowest possible cost. The work of developing new territory and of exploiting the ore bodies already discovered is carried along at the same time. The work of prospecting is the main one at the beginning and at the end of the mine's life. It is necessary, in the early days for the discovery of the ore bodies, and a property is not closed down until the work of exploration, which is done long in advance in a well-conducted mine, fails to expose new ore bodies. The entire process of this work, from the prospect to the mine, is explained in a series of articles by Mr. Etienne Ritter, published in *Mining Science* (Denver), from which the following notes have been abstracted (next page).

The ore bodies are reached by a main thoroughfare, which is a shaft or a tunnel. Numerous side roads branch from it, and in their turn subdivide themselves often into smaller paths leading to rooms of various sizes.

In a flat country this thoroughfare is a shaft, which may be straight or inclined but which goes down, and has for main utility to reach greater and greater depths. The side roads branching from it are the drifts or the tunnels run at regular depths, each usually one hundred feet deeper than the one above. As these side roads explore the vein on a given level they are called levels. These are the roads which lead to the rooms having no outgoing doors, such as the stopes. The stopes are the excavations in the ore. The winzes, or small auxiliary shafts sunk from some level underground, and the raises, or chimneys raised from one level to another, are the short cuts between two levels. The ore bodies lie in areas, which are cut as much as possible into blocks and squares and which are surrounded by the various roads and reached by them.

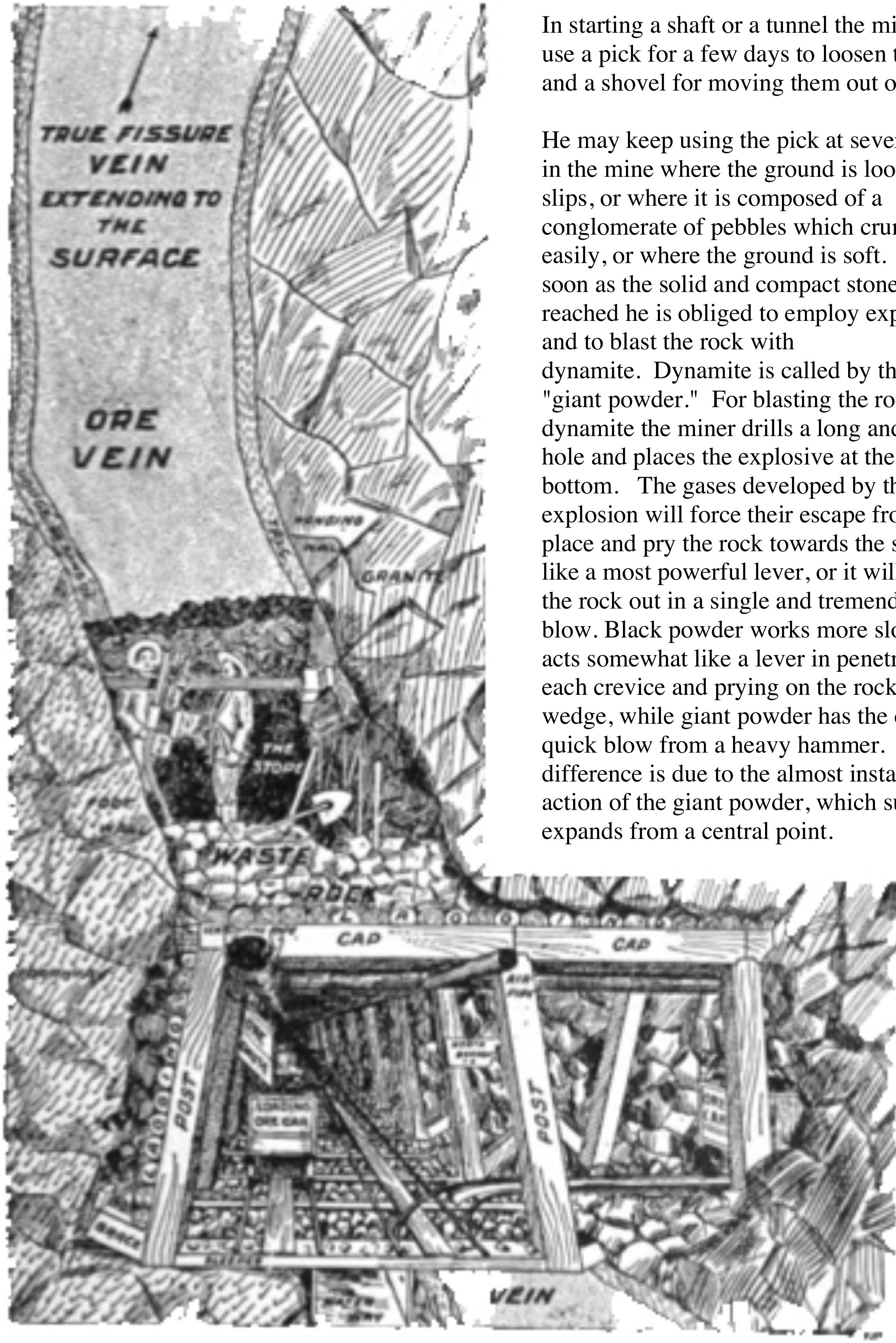
In good mining practice the ore bodies of one level are taken out, while in the one or two levels below these, the blocks of ore are divided and the roads built for every day use. Again, in the two lowest levels new productive areas are discovered, the shape and extent of the ore bodies are ascertained and the pathways that will permit the taking out of the ore in the cheapest and best way are planned and started. At the same time some roads may be driven into the country rock and fail to encounter the ore bodies which were hoped for along their course. Each morning the men with their tools, powder and a supply of candles go down the shaft. A part of the men leave at each level —the first, the second, and so on—until the last one is reached. At each level the crew divides again, a part branching off to the left and the other to the right; and, again along the drift the men separate to go to their different places in the stopes, till the mine is alive with men at work. From all the extremities the ore comes down ore chutes to bins or storerooms above the drifts. From there it is dumped into small steel cars and the ore or waste rock, as the case may be, is trammed to the shaft and hoisted to the surface.

On the surface, if the car is full of waste rock coming from some barren portion of the vein or from some road driven through the country rock, it is piled on the waste dump. The car takes another switch if it is filled with ore and is dumped into large storerooms, called ore bins. The ore lies there till it is taken later on to some mill or smelter, where the metals are extracted. When the mine is opened on the slope of a steep mountain it is much easier to use a main working tunnel instead of a shaft and branch roads, as crosscuts to the veins, drifts on the vein at the various levels, winzes and raises, are all connected with the lowest and main tunnel through which all ore taken out is finally trammed.

It seldom happens that the vein lies flat in the ground. In mines on veins dipping but slightly the main thoroughfare is a long tunnel, slightly inclined like the vein, which it follows, and called a slope. Each hundred feet, roads are pushed to left and to right from the slope. Some veins present near the surface and the ore body can be taken out by a quarry or a gigantic open cut. The mine workings are cut in the solid rock by hard and patient work and at a great expense. In following the miner from the time he enters the mine it is easy to learn how he opens the roads through the solid rock with the use of dynamite, and to recognize what are the different roads, shafts, tunnels, raises or winzes. When the ore has been reached it has to be removed. During the last fifty years great strides have been made in the art of mining which allow one to get the best results in nearly all the emergencies which may arise.

In starting a shaft or a tunnel the miner can use a pick for a few days to loosen the rocks and a shovel for moving them out of the way.

He may keep using the pick at several places in the mine where the ground is loose, full of slips, or where it is composed of a conglomerate of pebbles which crumbles easily, or where the ground is soft. But as soon as the solid and compact stone is reached he is obliged to employ explosives and to blast the rock with dynamite. Dynamite is called by the miners "giant powder." For blasting the rock with dynamite the miner drills a long and narrow hole and places the explosive at the bottom. The gases developed by the explosion will force their escape from that place and pry the rock towards the surface like a most powerful lever, or it will hammer the rock out in a single and tremendous blow. Black powder works more slowly and acts somewhat like a lever in penetrating into each crevice and prying on the rock like a wedge, while giant powder has the effect of a quick blow from a heavy hammer. This difference is due to the almost instantaneous action of the giant powder, which suddenly expands from a central point.



SHOWING DETAILS OF WORKINGS, TIMBERING, ETC.

It follows that a knowledge of how to place the holes so as to allow the powder the best show to do the maximum of work is necessary to the ordinary miner. A good blow at the right place will accomplish more than half a dozen at a wrong one. The holes for the powder are bored with a drill. The drill is a bar of steel from one to five feet long of octagonal section, so as to give a better grip for the hand than if it were round. These drills are usually seven eighths of an inch in diameter. The sharp end of the drill, called a bit, is a cutter with a sharp edge and two angular corners. In drilling a man holds the drill in one hand and turns it round and round, while at each turn he gives a blow on the head of the drill with a hammer, which he holds in his other hand.

With each blow a small, triangular piece of the rock is cut off as a piece would be cut from a cake. Then the miner turns the drills and cuts the next slice. The slice of rock falls into powder, and water is poured in holes drilled downward, so as toform mud and to prevent the holes from becoming clogged. The miner takes the mud off from time to time with a long and narrow spoon. In the holes driven upward the rock powder falls from them every time the miner turns the drill. The bit wears out and becomes rounded more or less quickly, according to the hardness of the ground. On an average the drills are sharpened each day. A drill is used in from three to five holes. The miner starts with a drill one foot long, drills in some three or four inches, then takes a drill three inches longer and keeps taking new drills each time three inches longer after he had bored a similar distance with the preceding drill. He ends with a drill six to nine inches longer than the depth of the hole.

In drilling down holes the miner has to raise the weight of the hammer at each stroke. In the upper holes his arm swings like a pendulum. The down holes are easier for the beginner to drill, but they require more muscular effort, while the upper holes require less muscular effort and a more accurate blow. The holes are drilled at an angle with the face to be blasted. The more slanting the hole is the less work the powder will have to do. A good miner will get the slant which will bring the bottom of the hole to the place where the powder will do its maximum work. If the bottom of the hole is not far enough in a part of the energy developed by the explosion will be lost. If it is too far in, the powder will not be able to break the rock and it will escape through the mouth of the hole and break off only a small amount of rock.

If the rock is soft drilling goes much quicker. But the hardness of the rock is not the only character to be considered. The worst ground to drill in is a ground of uneven hardness. Nearly everywhere in the early days, and in many places even today when the ground is quite hard, the holes are drilled by a team of two men. One man holds the drill with both hands and turns it while the other swings a double hand hammer of a weight of eight pounds and gives a full stroke.

The use of the double hand hammer is falling off more and more; it is replaced by the compressed air drill. When the corners of the bit have become rounded the drill has to be sent to the forge and sharpened again. At every mine a blacksmith is kept to sharpen the drills. To do this he puts them into the fire and heats them to a light cherry red color. Then he hammers them on the anvil into the proper shape. When the rock is hard the blacksmith makes the bit stouter, thicker and harder; when the rock is soft he makes the bit longer, thinner and sharper. In the first case the end to reach is to have a tool tough and able to stand hard work, while in the case of softer rock a sharper and longer bit will cut the rock faster. Later on, the blacksmith heats the drills again and puts them into water, in order to give the bit the steel temper. In that operation he varies the time of the cooling of the heated drill in the water so as to render the steel harder but, also, more brittle, or not so brittle and more easily worn out, according to the work for which the drills are sharpened. The hardness and other characteristics of the rock to be drilled through decide what kind of temper is the best.

It is an important thing to have a blacksmith who knows how to sharpen a drill well and to give it the right kind of temper. A good blacksmith must be able to recognize by the way the drills wear out that the miners are entering into some different ground, and he must be able to change slightly the shape and the tempering of the bits so as to meet the new conditions.

A miner who sees his drill biting well in the rock does his work better; while if his efforts are not rewarded because the drill is too soft and "does not stand," as the miners say, or if it is too brittle and breaks, he loses considerable time. The holes are drilled from eighteen inches to three feet deep in ordinary work. The hammer commonly used weighs four pounds. The miners call it a "single jack," to distinguish it from the "double jack," a hammer weighing eight pounds with a long handle. The double jack is used in team work, when one man strikes and the other turns the drill. When the miner has completed the holes he is ready to blast. The powder used is sold in boxes which contain a certain number of sticks of powder of the shape and size of an ordinary candle, with both ends fiat. There are usually thirty sticks in a ten-pound box, and as dynamite freezes at forty degrees temperature the sticks are more or less stiff. The powder is contained in strong, yellow paper, and the miner cuts it with his knife to give the stick a better chance to pack. The stick of powder is pushed into the hole and is packed carefully with a long wooden stick. The powder is introduced, cut in several pieces, and the cap and the fuse are introduced with the last piece. The fuse is a cord of gutta-percha containing in its center a column of fine gunpowder.

The miner lights the fuse and goes to some place of safety. During this time the black powder burns inside the fuse, reaches the cap, explodes it and with it the giant powder, which is transformed into gases. The gases expand so as to occupy a space twenty thousand times greater than the one in which they are enclosed. They thus develop a pressure of more than thirty tons per square inch and force the solid rock to break into fragments to give them room to escape. The rocks are streaked by numerous slips, planes of fracture, or lines of least resistance, along which the rock breaks in a few big chunks, or "breaks big," as the miners say; or it breaks into a thousand small pieces.

In every-day practice a miner seldom drills and fires only one hole at the time. He drills in the breast or in the face of the workings several holes of various lengths and inclined at different angles. He disposes them in such an order and at such places that all the explosions will work to the best advantage. The first hole not only will take a part of the block to be broken, but it will loosen a side of the piece of rock to be blasted by the second hole, and help the powder in this hole to accomplish its work.

The second hole will make easier in the same manner the work of the third one, and so on till the last one has exploded. The holes have to be fired in a carefully arranged order to give their maximum of results. With that end in view, the miner cuts the fuses of different lengths, the second two inches longer than the first and the next two inches longer again, till the last, which is the longest of all. A practiced hand can light the fuses so quickly that the difference of time in lighting them does not count.

The miner counts the explosions to make sure that all the holes have exploded. He knows then that he can safely pick the ground; that he can pry and tear down, without danger, all the pieces of rock which have been shaken by the explosions, but which are yet partially held by the solid rock.In some cases, like in the breast of a long and straight tunnel, for instance, the miner would have to walk too far before being out of danger. It has become the practice in such cases to fire all the holes at the same time from a distant and safe place by means of an electric battery.

In such wholesale firing the explosions achieve a good result on account of their "mass" by the magnitude of the forces developed. But the miners have no good means to be sure that all the holes have exploded. Many accidents are due to "miss shots," or shots which have not gone off. These are the result of numerous causes, but usually happen because the fuse burned out before reaching the cap. If the miner is not aware that a hole has not exploded he will pick the loose rock or drill again near it, and he may hammer on the dynamite and cause an explosion. In nearly every case, he will be killed or crippled for life.

When he knows that a hole has not exploded the miner goes back, after a long enough time has elapsed, to be sure that there is no more danger of an explosion. He will put a new fuse and add a fresh stick of dynamite and fire again. In nearly all cases the shot goes off the second time.When they are loading their holes, that is to say, when they charge them with dynamite, some miners deem it advisable to tamp them with a large amount of paper, or rags, or of loose dirt, so as to fill the hole nearly to its collar. That is quite unnecessary. The dynamite is transformed into gases so quickly that no gas has time to escape by the mouth of the drill hole before the result of the explosion has taken place and the rock is already broken. In the event of a "miss shot," it is very much easier and much less dangerous to slide in a new fuse with a small package of powder when the hole has nothing in it, than to dig out first a large amount of paper, of rags or of dirt.

The rock may break well or badly when it is blasted. That point is more important for getting good results and pushing the work rapidly than is the facility with which the holes are drilled. A miner will get better results in harder rock which breaks well than in a softer rock which does not "break good." In a ground which breaks badly the bottoms of the holes remain unbroken in the faces of the workings. They show that the powder did not find enough slips to help it. This ground is called "tight ground." The miner needs a great deal of experience in that kind of rock so as to concentrate the force of the explosions and get good results.

When the work consists of sinking a shaft or driving a drift, the rock which has been blasted has to be carried out of the way before new holes can be bored. In the drift, a heavy sheet of iron, followed by pans four by six inches, six or eight feet long, receives all the rock blasted. Shoveling on the smooth surface makes the work much easier. In the stopes, ore chutes are built just above the levels along the drifts and the rock broken by the shots falls into these chutes, slides down by gravity to the doors at the bottom and is dropped from there into cars and wheeled away. (End of Article)

The article oddly ends abruptly here and a new topic begins. The new article does not necessarily have anything to do with mining or explosives. The whole layout of this journal is a bit like reading news on the internet but of course, the information is months if not a year old by the time the reader sees it. There is an index by subject but the articles themselves are not grouped according to the index. I suppose we would have to live in 1909 to really understand the context of technical publication and the mentality of the reader. This provided an interesting visit to that framework and I enjoyed the trip back in time.

Engleby & Bro. Co. Oil Wick Lamp

Dave Johnson

A new name to add to the list of miners' oil wick cap lamp manufacturers is that of Engleby & Bro. Co. of Roanoke, Virginia. I recently added this copper cap lamp to my collection. It is marked: ENGLEBY & BRO. ROANOKE VA. on the side of the font. It is also stamped with individually applied letters on the font and shoulder with W. DOWER, most likely the owner. The lamp is made of somewhat heavier than usual copper sheet stock. The cap hook is brass. It measures 3" tall to the top of the lid. The spout is single walled. This lamp has seen much use in the mines. The 1893 Roanoke City Directory lists Joseph T. Engleby as President of Engleby & Bro. Co., Inc. with John Engleby as Vice-President and Treasurer. An advertisement in the September 15, 1895 Roanoke Times has Engleby & Bro. Co. advertised as being in the tinning, roofing, spouting, plumbing and steam fitting trade. They are also advertised as having the "Most complete line of stoves and ranges in the city", with their business located at 17 Salem Ave. in Roanoke. In the 1922 City Directory Engleby & Bro. is still listed, along with Engleby Auto Supply Co., Inc., with the same Joseph T. Engleby listed as president of both firms. A search has not located any further information on this previously unidentified maker of oil wick cap lamps.

Inside a Husson Peg Lamp

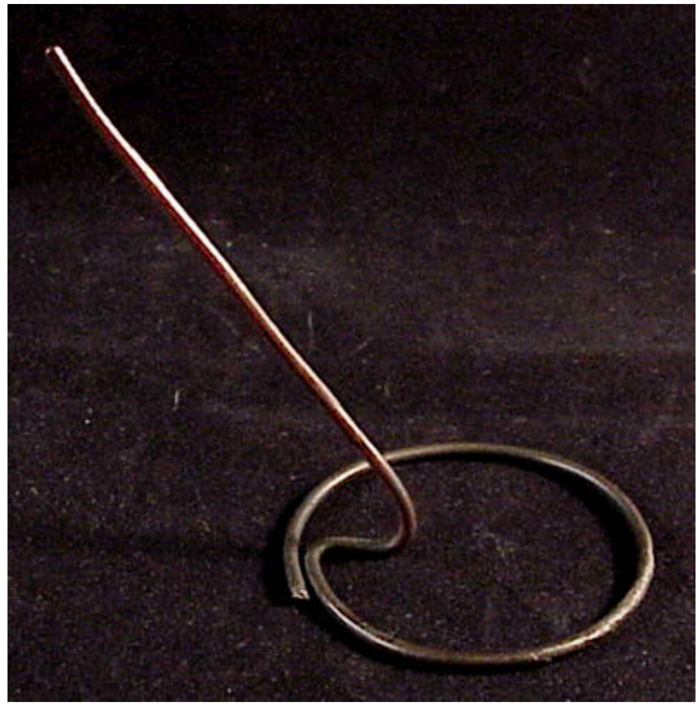
Dave Johnson

The Knippenberg Manufacturing Company of Oshkosh, Wisconsin produced a variety of different model miners' oilwick cap lamps. One of their most unusual models is the No.22 Peg Lamp. Some miners were slow to give up their candlestick for oilwick lamps. One of the two ways that Knippenberg provided lamps for this niche market was their No. 22 Peg lamp. The other was their No. 2, 3, 4, 5, and 6 models offered with a removable spike.

What made the No.22 Peg Lamp unique was the fact that it could be used with a miner's existing candlestick in one of two ways. First, it had a peg soldered to the bottom that fit into the thimble of a miners' candlestick. Second, it had a copper or brass (both have been found) loop that slides over the spike of a candlestick up to the thimble. While both these attributes are unique, there are surprises inside the lamp.

All Husson Lamps are easily identified by their copper spout tips and some also have copper rods on the top of the spout that ran down into the lamp to convey heat from the flame in to the font to melt the Sunshine fuel. An accessory that looked like a long copper nail that was pushed through the center of the wick into the font was also sold by Knippenberg.

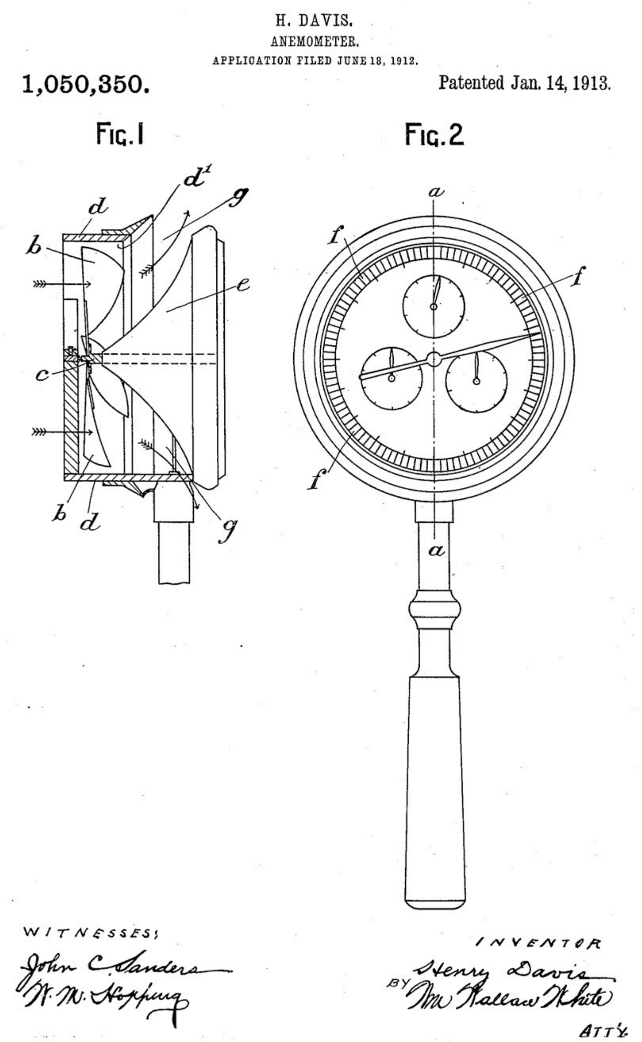
Inside the Husson No. 22 Peg Lamp the copper spout continued down to the bottom of the font. This piece had holes all around to allow the melted fuel to better get to the wicking. The most unusual internal feature of this lamp was the copper wire that was installed when the lamp was assembled. This copper wire formed a loop in the bottom of the fuel font and then turned and went up the spout and projected out about ½ inch. Given the shape of this wire, with its multiple bends, it could only have been placed in the font and spout when the lamp was being assembled. This wire effectively melted the fuel through the base of the font by conveying heat from the flame.



Since the Peg lamp in my collection is filled with sunshine fuel I have not been able to see inside the lamp. It wasn't until Tony Moon recently sent me a Peg Lamp that was totally rusted out that I was able to salvage these copper and brass components. The idea was to salvage the brass bracket from the lamp lid. This lamp, which was so rusted and fragile that it could be taken apart with your fingers, was also full of Sunshine fuel. Since the lamp itself was worthless I decided to take it apart and found these two surprises inside.

A Different John Davis Anemometer

by Dave Johnson



Mechanical anemometers are an instrument used to determine the volume of air entering or exiting mine workings. They were invented by Benjamin Biram, house steward to the Earl Fitzwilliam, of Wentworth Woodhouse, owner of numerous collieries in South Yorkshire, England, in 1842, with a patent being granted in 1844. It was in his capacity as mine manager that Biram saw the need for a device to measure air flow.

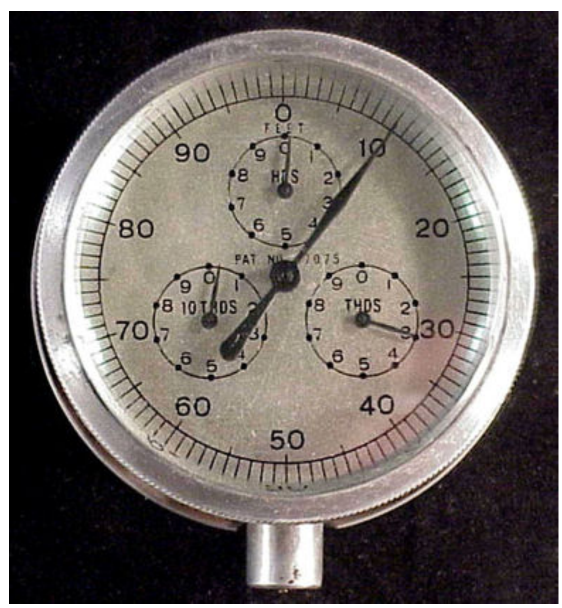
At Lower Elsecar Colliery a methane explosion in 1852 resulted in the death of 12 miners and injury to 10 others. In response to this explosion, Benjamin Biram, who managed the mine for the Earl Fitzwilliam, fitted the first underground fan to improve ventilation.

An inquiry found that the explosion had been caused by reckless behavior of the miners; a ventilation door had been propped open which resulted in methane accumulating and some miners using unguarded safety lamps. Biram was criticized by the inquiry for absence of printed rules in the colliery, inadequate maintenance of the lamps and poor supervision of the workforce but the judge did praise the ventilation arrangements in the mine which prevented

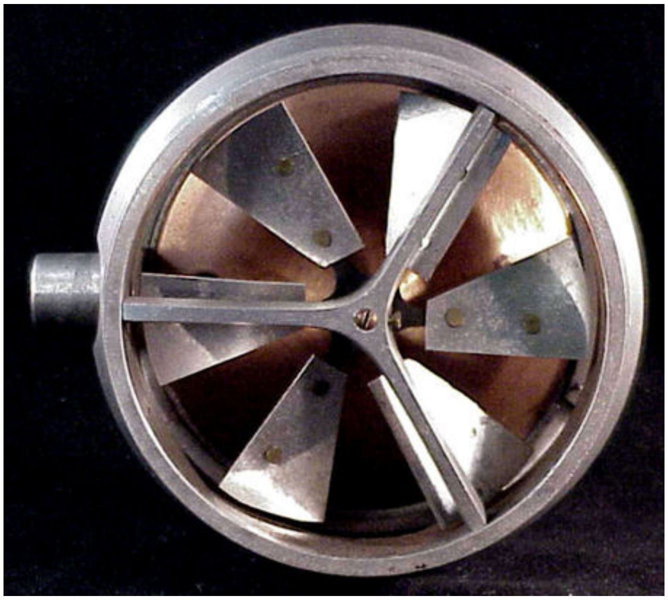
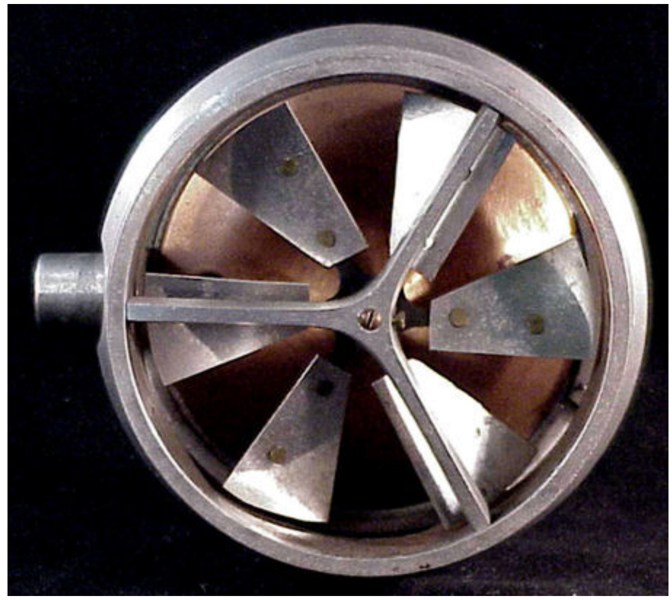
After receiving his patent, Biram approached John Davis with his instrument. In 1845, John Davis announced the first production of Benjamin Biram's newly patented anemometer. With this Davis became the first commercial manufacturer of anemometers for mine use.

The formula used most often in mine ventilation using an anemometer was q=av, in which q equals the number of feet of air per minute, a equals the area of the airway in square feet and v equals velocity of air current in feet per minute. Anemometers, as used in mines, were predominantly produced in two styles, the Biram-style which have the dials and vanes on the same plane and the offset-style which has the dials perpendicular to the vanes.

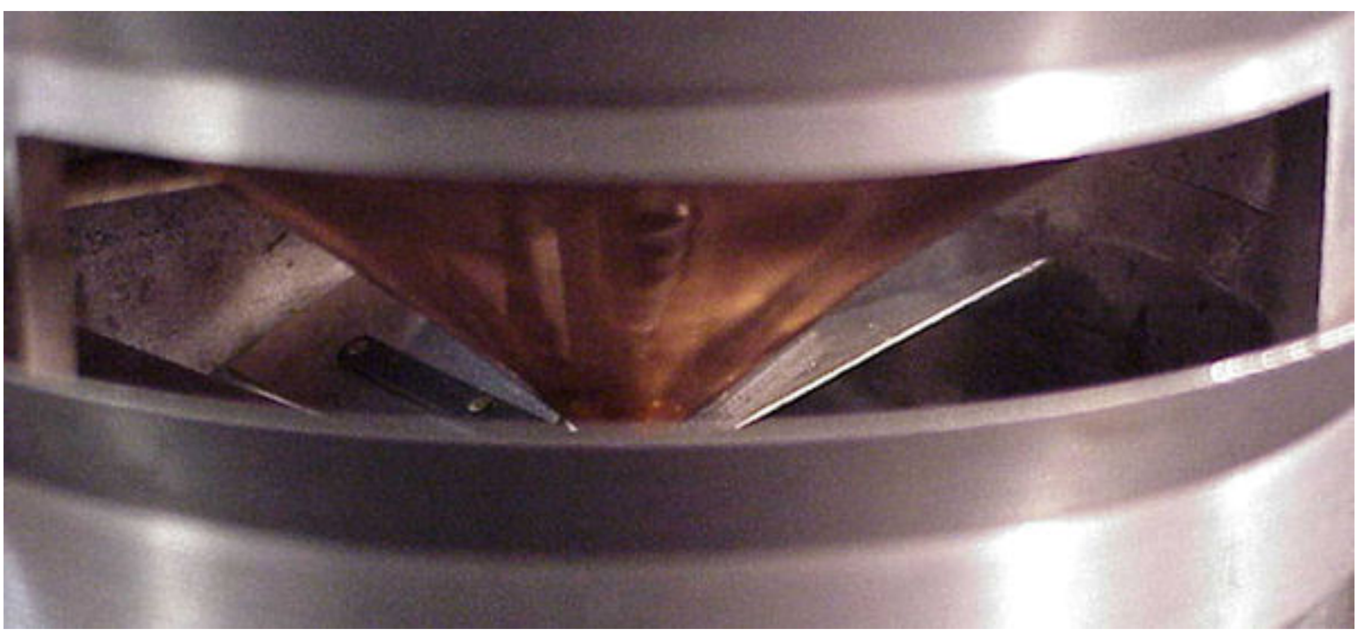
Recently I came across a type of anemometer unlike any I have seen before. It is unlike the traditional Biram-style or the offset-style. Best of all it has the manufacturer's name, patent number and patent date prominently displayed on the outer frame. The manufacturer is John Davis & Son Derby Ltd. It has a patent date of January 14, 1913 and Patent Number 1050350.

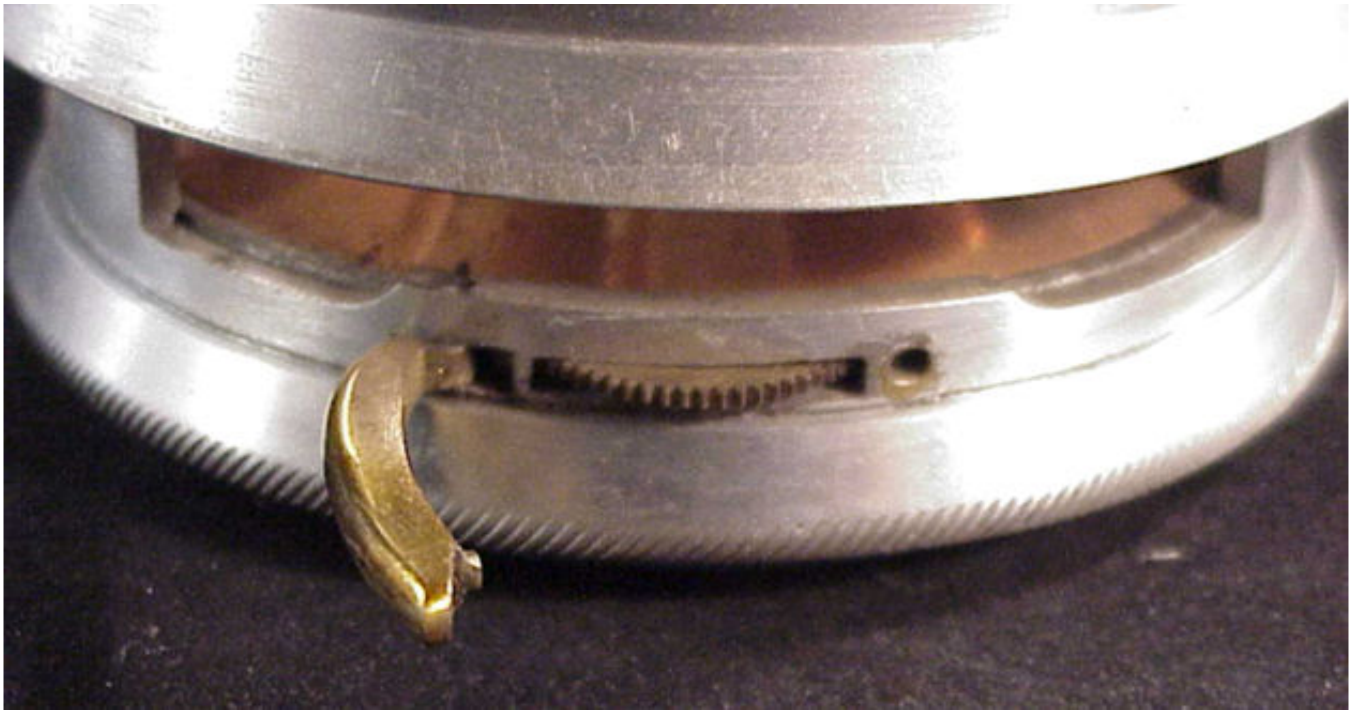


Unlike anemometers with “return to zero levers”, this instrument has a knurled wheel that turns the dials and has a hinged brass cover over the wheel. The majority of this instrument is aluminum with brass screws, brass rivets holding the vanes to the arms, brass cover on the dial wheel and a copper cone behind the dial face. The carrying case is aluminum with brass fittings. The instrument is 3 ½” in diameter and 2 1/8” high. The dial glass is very thick with a beveled edge. A handle screws into the threads at the base of the face.

When John Davis died in 1873, at the age of 63, his son Henry took over the business keeping its name John Davis & Son, expanding the product line and eventually moving its workshop facility in 1875 to All Saints Works, Amen Alley in Derby. Miners’ safety lamps manufactured and listed in a Davis catalog from 1887 include a Clanny, Bonneted Clanny with Stoke’s Shut-off, Mueseler and Marsaut. The firm was active in overseas markets with agents in Australia, Canada, China, Japan and South Africa.





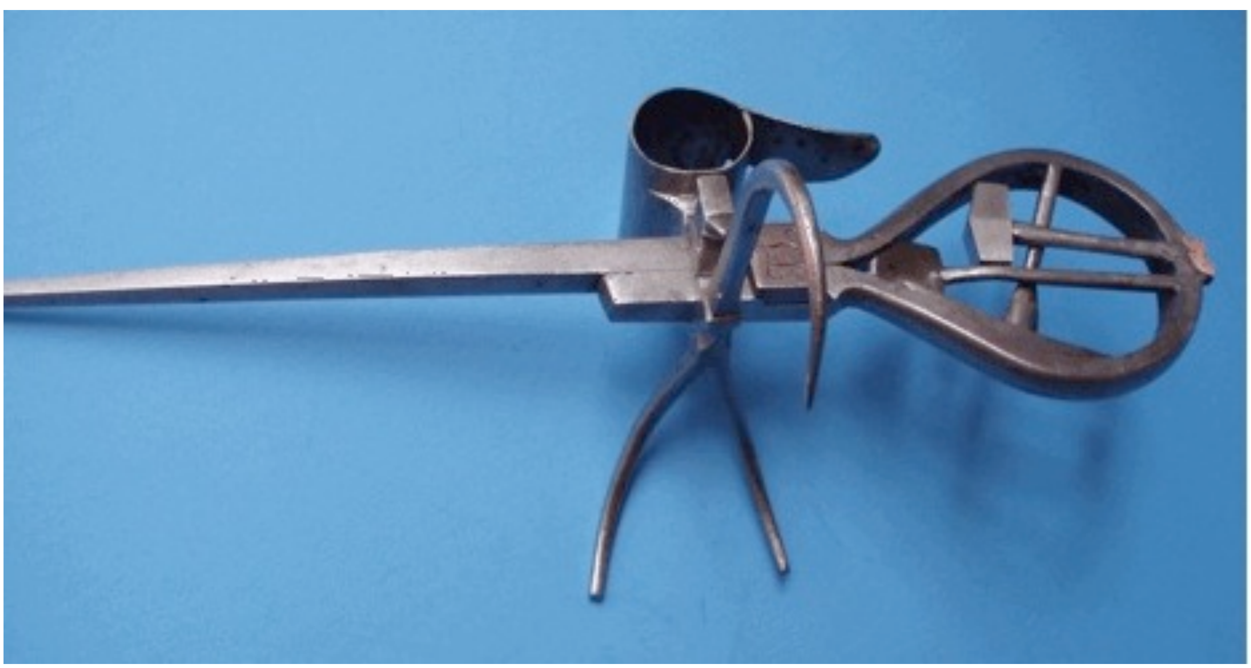
In 1900 Henry's brother, Herbert, was given a 4-year contract to sell the company's products in the US through a branch office in Baltimore, Maryland. The U.S. branch office was so successful, that in 1912, Herbert Davis resigned and formed his own company, Davis Instruments of Baltimore, that continued to manufacture many Davis Derby products, including anemometers , Davis instruments is still in business today. Herbert Davis was succeeded by his son Alfred who died in the late 1960s.

This is a unique instrument for the mining collector and I was happy to add it to my collection. Interestingly when researching this piece I came across photos of it on the Goodwill auction website where it sold for $51 in December of 2011. I know that it is the same piece because of the name scratched on the inside of the carrying case lid that can be seen in the Goodwill auction photos. It was subsequently offered on ebay, where I purchased it.

Butte Miners' Presentation Candlestick

by Al Winters

A number of presentation candlesticks were made by an exceptional but unknown Butte Montana blacksmith (?) and presented to mining dignitaries from the Butte area. The sticks are adorned with miniature tools and an example owned by Tony Moon is illustrated in Wilson and Bobrink's Miners Candlestick Book. The known sticks by this blacksmith (?) are all distinguished by a copper heart dovetailed into the back of the handle. Unfortunately the history of many of these candlesticks and the men they were presented to has been lost.



The candlestick in the pictures was displayed in the World Museum of Mining in Butte, Montana and at that time owned by David Johns of Butte.

The candlestick was acquired by Bill Goldman, mining artifact collector of Payson, Arizona in 2001. At that time, Mr. Johns provided the following history. In 1906 (?) the stick was given to his great grandfather, David F. Johns (B1872-D1941). Mr. D.F.Johns was a miner and prospector and operated a small gold lease in Marysville near Helena for several years. He later worked as the superintendant (?) of the Elkhorn Mine between Butte and Helena. Dave Johns who is now 89 years old does not remember the specifics of how or when his grandfather acquired the candlestick but knew that the original recipient was an important mining figure. He also recalls hearing that seven (7) other Butte tool sticks had been made by a machinist (?) working on the Butte hill whom his grandfather knew.

Mr. Johns does not recall the exact name represented by the engraved letters but hearsay indicates the original recipient of the candlestick may* have been John Benton Leggat, a prominent Montana Mining Engineer. Mr. John Leggat was born in St. Louis, MO in 1869. He completed a course in Mining Engineering in 1890 at Washington University. Following graduation he located in Butte and initially undertook development of several silver mines in Beaverhead County where he managed the Argyle Mine in Vipond Park. After 1893, he operated several mining properties in the Butte District under lease and bond and also conducted an engineering business serving regional mines in the Butte and Helena area. Among other ventures he served as President of the April Fool Gold Mining and Milling Company in Nevada at Delmar and as Director of the Southern Cross Gold Mining Company operating the Cable Mine north of Anaconda, Montana. Leggat also participated as partner and principal in many local residential and business properties.

• There is no known proof (either photographic or documentary) that the stick was presented to Leggat, only hearsay and the documented personal admiration of associates and miners alike who worked for and with Mr. Leggat.

Mr. Leggat was a Freemason and Member of the Algeria Temple in Helena Montana. In 1910 he was instrumental in the founding of the Shiners Bagdad Temple #125 in Butte. At that ceremony he was made an honorary member and presented an engraved copper plate enclosed in a solid electrolytic copper frame made from Butte copper. He served as the 1905 Potentate of the Algeria Temple in Helena, Montana. Other positions held were High Priest, Eminent Commander, Grand Royal Arch Captain and Imperial Representative of the Mystic Shrine. He also was a founding and active member of the Silver Bow B.P.O.E. and a member of the Silver Bow Club and Butte Golf Club.

Mr. Leggat built his elaborate Victorian-era Butte home in 1897 at 401 West Granite Street. The home is on the National Historical list and a favored attraction in Butte. In 1901 he married Ms. Hebe Ashley in what at that time was claimed the most lavish wedding of Helena, Montana. The couple lived in their Butte home until 1913.

Mr. Leggat left Butte in 1913 following consolidation of much of the district properties by the Amalgamated Copper Company (Anaconda). The Progressive Men of Montana carried his biography in 1903 and it was said of him “While men less resourceful and more cautious are thinking of a plan, he is accomplishing a result.” The following caricature of Leggat was made in 1907 and published in Cartoons and Caricatures of Men in Montana. Note the ore sample bags and Old Glory Mine.

J. BENTON LEGGAT,
Mining, Butte.

References:

1. Montana History, WIKI, National Register of Historic Places, Silver Bow County

2. History of Montana (Vol. 3) , pg. 37, by Helen Fitzgerald Sanders

3. Cartoons & Caricatures of Men in Montana, 1907 by E.A.Thomson

4. Progressive Men of Montana, 1903, Chicago- A.M. Bowen & Co. Contributors: David Johns, Bill Goldman, John Burke, Guy Palmer, Lloyd Harkins